Review of NBDC stories prepared as Most Significant Change contributions: Notes and feedback from a review meeting on 28 October 2011

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Summary

On 28 October 2011, eight project stories from Nile projects 2, 3 and 4 were assessed by a panel of five judges. Three further Nile 5 stories were submitted to CPWF.

Four stories selected for presentation as part of the basin report; four were identified as suitable for inclusion in project reports. All required further revisions.

Story	Title	Authors	Result
Story 1:	Cultivating a broad-based analytical research approach to rainwater management issues; the first fruits.	Alemayehu Belay, Alan Duncan, Eva Ludi, Josephine Tucker and Katherine Snyder	Selected as a basin story after small revisions.
Story 2:	A fresh approach to research development and dissemination through the use of Innovation Systems.	Simon Langan, Alan Duncan, Bharat Sharma, Kees Swaans, Beth Cullen, Eva Ludi, Josie Tucker.	Too early; further develop in a later phase. Can be included as a 'project story'.
Story 3	Participatory hydrological monitoring in Ethiopia.	Birhanu Zemadim, Matthew McCartney, Bharat Sharma, Simon Langan.	Selected as a basin story after small revisions.
Story 4	Mainstreaming geo-referencing and the use of geographical information systems (GIS) as a tool for the planning of rainwater management.	Catherine Pfeifer, An Notenbaert, Dejene Sahlu.	Selected as a basin story after small revisions.
Story 5	Increased understanding of the "strategies at landscape scale" concept.	An Notenbaert, Catherine Pfeifer, Lisa-Maria Rebelo.	Selected as a basin story after small revisions.
Story 6	Change in project strategy resulting in additional outcomes / benefits.	Teklu Erkossa and Charlotte MacAlister	Substantially revise and include as a 'project story.'
Story 7	Integrated approach to the analysis of RWM impacts in the Blue Nile using ECOSAUT.	Kindie Getnet, Nancy Johnson, and Charlotte MacAlister.	Substantially revise and include as a 'project story.'
Story 8	Applying global weather forecasts to generate climate data, drive hydrological models and plan water use applications.	Dan Fuka and Charlotte MacAlister.	Substantially revise and include as a 'project story.'
Story 9	Communicating Inside Out – The Nile Basin's First Year	Peter Ballantyne	No feedback yet
Story 10	National platform building on land, water and NRM: Momentum for change	Kees Swaans and Tilahun Amede	No feedback yet
Story 11	From Livestock-Water towards Consolidated RWM solutions in the Nile Basin	Tilahun Amede and Don Peden	No feedback yet

How were the most significant stories selected? Who was involved in the selection?

After sharing the 11 stories submitted by the projects with the panel Judges, eight stories from the various Nile projects, namely N 2, N3 and N4, were assessed by a panel comprising, Boru Douthwaite, Ranjitha Puskur, Bruno Gerard, Peter Ballantyne and Tilahun Amede on Oct 28, 2011. The selection of the panel members was based on mix of disciplines and neutrality from the various projects. The stories from Nile 5 were not included in the assessment as they will be assessed by the CPWF management team along with other stories from coordination projects of other basins.
The judges spent about 90 minutes clarifying the objectives and the purpose of the stories and discussing the criteria – and process – to be used to assess them.

In the end, five interlinked criteria were used to assess the stories, which were derived from discussion on each story line, their objectives and applicability of the MSC (as opposed to specifying criteria up front).
The 'emerging' criteria used to assess the stories were:

Assessment Criteria

The emerging' criteria used to assess the stories were:

1. Showing the change: Does the story convey specific change and its significance?
2. Showing the learning: Does the story show what the project team or others learned from the change?
3. Telling the story: How is the story told, does it catch the attention of the reader?
4. Exemplifies CPWF approach: Does the story illustrate or highlight key elements of what CPWF seeks to do - Research as a lever for change, developing methods and approaches that have potential to be international public goods?
5. Basin-wide significance: Does the story reach beyond its immediate context?

Process

The judges spent some time clarifying the purpose of the stories and discussing the criteria – and process – to be used to assess them.

In the end, the criteria (see above) used to assess the stories were derived from discussion of each (as opposed to specifying criteria up front).

On purpose, key conclusions were that the MSC exercise encourages teams to self-reflect on progress and activities, helps us document outcomes and progress in non-usual ways, and potentially helps us share insights with other basins.

The four 'basin stories' should be revised as necessary and included in both the individual project reports and the report of the Basin Leader; the four 'project stories', after any revisions, should be included in the appropriate project reports only.

Some other initial reactions on the process:

- In general, 'forcing' an arbitrary 3 stories per project results in some 'desperate' attempts to get something out - which can lead to some disappointing results. Better perhaps to get a few very good stories than many substandard ones.
- We may need to look again at the guidelines or template used, to help authors focus on – and present in summary form - the actual change and what the story is about
- It is a challenge to capture the processes, and the 'back stories' behind the stories that get presented.

Feedback on Specific Stories

Title	**Story 1: Cultivating a broad-based analytical research approach to rainwater management issues; the first fruits.**
Authors	Alemayehu Belay, Alan Duncan, Eva Ludi, Josephine Tucker and Katherine Snyder.

Domain

The Story: Introduction

This is a one-year long evolutionary change story involving researchers from national partner institutions who took part in a baseline diagnosis aimed at assessing planning, implementation and innovation of rain water management strategies and livelihood contexts in the three NBDC sites. The report is compiled based on an electronic survey conducted with researchers towards the end of the research exercise.

Phase 1: Orientation - Planting the seed

Research started in November 2010 with an orientation for researchers on the concept of rain water management strategies and insights on research methods and tools for data collection. This process enabled joint planning of the baseline research tools, helped to clarify concepts and research questions around complex issues, and enabled the local researchers to feel a sense of ownership over the research process and follow up piloting under field conditions.

Phase 2: Field work – Nurturing the seed emergence

For each of the three NBDC sites, two national partner institutes were asked to form a joint research team, with one institute acting as lead for budget administration as well as the overall research exercise. The partnership set-up was to designed to include a regional university located in the vicinity of the research site and an agricultural research center. The N2 project team joined the research team in each site at the initial stage of the field work to provide guidance and mentoring. This resulted in improved data quality,

Quoting some of change stories collected from researchers:

> "*I learned important lessons regarding qualitative research design, in terms of how to reconcile and verify different perspectives from various actors through triangulation*"
>
> "*The research methodology was different from what I knew before. Data collection mechanisms like historical timelines, community mapping and focus group discussions were new to me. In my research institute, quantitative data collection is more common than the qualitative method*."

Phase 3: Analysis workshop and findings – Big tree

During this stage, researchers from each site came together to reflect on their field work and give deeper thought to data collected through the baseline exercise.

> "*In my future research career I will not try to use numerical indicators only to address a given research problem, rather I will try to complement it with qualitative data analysis techniques. Because qualitative data analysis enables researchers obtain in-depth information about the research problem so that I will obtain a more realistic feel of the world that cannot be experienced in the numerical data and statistical analysis used in quantitative research"*

The Fruit – Change stories collected

Change happened through an evolutionary process; starting from the initial phase and showing more visibility towards the last stage of the research exercise. This contributed to changes in attitudes and skills of researchers in

the way they do research; i.e. from quick-fix, technical and quantitative methods to more broad-based, analytical qualitative methods.

This change was envisaged in the NBDC Impact Pathways 4: Researchers: Universities, NARES, Nile BDC and other BDC projects, are using N2 results in their research and extending research approach to other areas (**Change in Practice**)…….resulting in **increased capacity to do this type of research, appreciate the benefit of framework approach to assessment of RMS, data and indicator values on suitable social and ecological niches for RMS, and impacts of various RMS on hydrology and livelihoods (changes in knowledge, skills and attitudes)** through strategies co-developing methodologies.

The research exercise also changed the views of researchers towards the rural community, especially on how participatory methodologies help to foster better dialogue on community problems and contexts.

> "*This kind of exercise helps to spend more time with the local people who are directly related to local problems, needs and concerns"*

The way the research exercise engaged multiple institutes with researchers having different backgrounds created a strong multidisciplinary research team, which served as a melting pot for individual researchers to learn better and different ways of looking at contexts. This arrangement also gave sense of ownership to the research exercise, a positive sign of partnership.

> "*It involved multiple actors and detailed study than the routine baseline survey conducted by my research center*"
>
> "*The fact that it involved various partners and expertise made it different. It implanted ownership feeling among the partner institutes*"
>
> "*Because of this baseline research, I came to know and share experiences with different individuals from different institutions*"

What was unexpected?

We were optimistic about planning cross-center collaboration between two national partners (e.g. agricultural research center and university), making one the lead organization in the partnership resulted in unexpected power dynamics which had to be dealt with carefully.

We were overly optimistic in terms of timing and delivery of quality data in a rather short period of time. Involving several researchers from different institutes resulted in fragmented results (i.e. individual researchers analyzed a specific set of the collected information and wrote only a part of the site report). Responsibility for pulling together the different sections was not clearly specified at the outset – but was implicitly assumed to be with the lead research organization. Backstopping efforts by ILRI, IWMI and ODI were considerable and need to be better balanced in future.

Constraints – weeds

Natural resource management efforts are more technology driven at the cost of overlooking institutional constraints. Bringing the institutional constraints into the picture was, and still is, a challenge.

Lesson: developing partnerships with local actors is like a marathon, it needs considerable amount of time, commitment and incentive to be fruitful.

Rewards: There is a stronger interest to work in similar collaborative partnerships in the future, which is a benefit for the project as well as national partners.

Feedback on story	• Good example of what the CPWF is trying to do - change KAS through the way research is done

	• Approach used makes sense - getting multi-disciplinary teams together to go to the field and make sense of what they see. • Plausible anecdotes • It is a method with potential to become an IPG • There seems to be 2 stories – changing attitudes of researchers – building the partnerships • Incoherent, not enough of a 'story'; story not yet mature? • What's the 'real' story? What's the change? • Multi-dimensional, cross-disciplinary • Make clear what's the change
Conclusion	• Selected as a basin story after small revisions taking into account the comments above.

Title	**Story 2: A fresh approach to research development and dissemination through the use of Innovation Systems.**
Authors	Simon Langan, Alan Duncan, Bharat Sharma, Kees Swaans, Beth Cullen, Eva Ludi, Josie Tucker.

Domain:

This story focuses on the research approach taken by Nile 2, a work package based on developing better integrated rainwater management strategies through improvements to technologies, institutions and policies. A central feature of the proposed N2 work was the establishment of a model catchment or series of model catchments in which best practice would be tested and demonstrated. At the outset best practice was considered to be principally, but not exclusively, based around evaluation of technical and physical interventions at landscape (catchment) scale, as well as some work on policies and institutions to improve livelihoods. However, after much discussion and reflection amongst researchers over a six month period, the initial research approach developed into a more inclusive **innovation systems paradigm.**

Description: An Innovation Platform (IP) is a need-based network bringing together different stakeholders for exchanging knowledge, generating innovation and developing joint action. Stakeholders are drawn from different interest groups, disciplines, sectors and organisations and come together in platforms to share experience, develop joint agendas for change, and test new solutions to their common problems. Within the context of the NBDC, platforms aim to bring about change in livelihoods and natural resource management, as well as influence practice and policy related to natural resource management planning, implementation and evaluation. The IP approach recognizes that improvements to livelihoods and environmental integrity depend not just on on-farm technologies, but on wider institutions, markets and policies. Our aim is to establish IPs at the local district level (the current focus) and link them to regional and national platforms to form innovation systems for land, water and natural resource management. This multi-level system will help to scale out successful approaches, and also enhance the understanding of local rainwater management challenges and solutions among regional and national level decision-makers, making it more likely that these actors will develop appropriate supportive policies.

Community discussion during resource characterisation exercise, Dapo Watershed, Diga district. (Photo credit: ILRI/Leta)

Intense farming and deforestation in Jeldu district (Photo credit: ILRI/Lamond from Bangor University).

The emphasis of innovation platforms is on creating conditions which foster innovation capacity. Desired outcomes are changed habits and practices and improved links and communication between stakeholders. Baseline findings have indicated that 'innovations' in natural resource management and agricultural practice are currently driven in a top-down fashion, with little opportunity for local stakeholders to participate in developing solutions. By fostering more interaction and sharing of knowledge at local level, it is hoped that a more interactive approach will emerge. The ultimate goal is improved rainwater management, but it is recognized that this is a long-term goal. By changing the research approach to one which acknowledges context specific socio-economic factors, indigenous knowledge and encourages local innovative capacity, we hope to achieve longer term sustainability. Whereas the previously proposed model catchment approach produces valuable results in terms of demonstrating and

evaluating technologies, the results can be difficult to replicate in other agro-ecological and socio-economic settings and can suffer from a lack of ownership and thus sustainability. The results may also overlook important institutional or social constraints which would hinder the successful implementation of technical 'best practices'; innovation platforms can help to identify these and come up with solutions. The IP approach allows different sources of knowledge to be translated into action through development planning and implementation with a range of actors, including NGOs, government line ministries at district level, champion farmers, researchers and the private sector. IPs require patience but the contention is that this patience will be rewarded by significant changes in local innovation capacity that will last beyond project exit, and the prospect of more sustainable and lasting improvements in rainwater management.

The Experience:
To date our emphasis has been on establishing local IPs at three sites: Diga, Fogera and Jeldu. These three catchment areas were identified as part of the earlier model catchment approach and have been instrumented for hydro-meteorology. The platforms bring together a range of key actors at *woreda* (district) level to jointly identify constraints to improving land and water management and plan joint practical actions to deal with them. A further aim is to provide a mechanism for seeking resources which can be used to implement practical interventions identified by the platforms. In the coming months more attention will be given to IP establishment at the regional and national level, and to developing mechanisms to link communities into the IPs.

At the current stage the process has largely been established by a partnership of researchers intimately involved with the NBDC. There is some limited involvement of local Woreda offices and regional agricultural research institutes. This early work has focused on making an initial assessment of the different stakeholder needs. Involvement of a wider range of actors is about to be initiated and will include National Research Institutes, Woreda offices, communities and businesses. Ultimately the involved parties will also be the beneficiaries.

The Constraints:
A principal constraint is the amount of time needed to build and maintain such an approach which involves other related issues such as trust which has to be built up over time, and given the novelty of the approach there will undoubtedly be skepticism from some of our stakeholders as to the benefit and sustainability of IPs.

The Future:
We anticipate that fully incorporating platforms into the process of developing rainwater management strategies will affect how research results are implemented, taken up and disseminated. IPs have the potential to support a novel way for extension services to interact with farmers – instead of pushing specific technologies, labelled as innovations – extension agents and farmers are both involved in the development and implementation of innovation. By recognizing that knowledge comes from multiple sources, not just our own research outputs, the approach are more inclusive. As a result, we anticipate that the benefits will be spread more evenly and sustainably than if we had stayed with the model catchments envisaged at the outset. Success will be monitored by looking at changes to networking behaviour and other work patterns of key local actors. We ultimately aspire to foster innovation and encourage actions that will improve livelihoods and result in more sustainable use of natural resources at the landscape level.

Feedback on story	• No clear change spelled out • Bit theoretical write-up of the intention • Premature to be a story of change • Nice exposition of why IPs and how we want them to evolve • Nicely written • Not concrete enough • A rather theoretical write-up - concern that this work still remains rather up in the air
Conclusion	• Good description of what is happening / planned but, as the authors mention, it is too early to show the changes. This story should be **further developed in a later phase**. It does not need revision, and can be included as a 'project story' in the project report as is.

Title	**Story 3: Participatory hydrological monitoring in Ethiopia.**
Authors	**Birhanu Zemadim, Matthew McCartney, Bharat Sharma, Simon Langa**

Domain: research

The story

The identification of appropriate and sustainable rainwater management strategies requires, amongst other things, sound understanding of dominant hydrological processes. In the absence of this knowledge physical rainwater management interventions are likely to operate sub-optimally or even fail. For example, water harvesting ponds may be of the wrong size, badly located or inappropriately managed.

Detailed understanding of hydrological processes can only be obtained through the establishment of monitoring networks (comprising a variety of different instruments) that measure water fluxes at different locations within a catchment. The establishment of such networks is complicated, time consuming and costly. Much of the instrumentation is sophisticated and very expensive. For this reason, with the exception of South Africa, very few "research" catchments have been established in Africa. Furthermore, to avoid interference from people and problems of vandalism and theft, such catchments are typically established in uninhabited areas and, with the exception of the researchers, people are usually excluded. There are few examples of establishing networks in locations where people live.

In Ethiopia, as a contribution to the Soil Conservation Research Program (SCRP), some equipment was installed in four small catchments in the 1980s. More recently, some small catchments, located to the east of Lake Tana, have been partially instrumented as a contribution to the Tana-Beles Integrated Water Resources Development Programme. However, in both cases the focus of the monitoring was primarily to provide insight into erosion and sediment dynamics and the level of instrumentation was insufficient to gain detailed understanding of hydrological processes.

A key objective of the N2 project is to gain insights into hydrological processes (e.g. water budgets and partitioning of rainfall between soil moisture, groundwater and runoff) in order to inform decision-making about different rainwater management options. To do this it was decided to establish three research catchments, one in each of the *woredas* where the research is being conducted (i.e., Jeldu, Diga and Fogera). It was also decided to engage with relevant stakeholders and communities in the establishment of the instrumentation networks. It is hoped that this participatory approach will be beneficial for several reasons:

i. Firstly, it will instil trust and goodwill amongst the community.
ii. Secondly, it will provide the opportunity for the local communities to gain insights into the hydrological regime of their locality, which in turn will hopefully contribute to better understanding of the likely impact of different interventions on water resources.
iii. Thirdly, it will contribute to the establishment of a conducive atmosphere for the flow of knowledge between researchers and the communities and *vice-versa*.

The Participation Process:

The process of participation began with consultation of relevant national institutions at the start of the project. This included the National Meteorological Agency (NMA) and the Ministry of Water and Energy (MOWE) to ensure that our proposed monitoring met with their approval and satisfied their requirements. Intense discussions with directors and technical staff from both institutions culminated with the signing of a tri-partite MOU in April 2011. Subsequently, staff from both NMA and MOWE has assisted with locating and installing instruments. At the end of the project all equipment will be handed-over as additions to the national meteorological and hydrological monitoring networks. It was also agreed that the project would train staff from both the NMA and MoWE in the use of some of the equipment imported from overseas.

The three research catchments were established in previously unmonitored locations over a period of several months (May to August 2011). The participation of the local communities commenced with a reconnaissance survey conducted at all three locations in August 2010. During this we discussed our plans with *woreda* and bureau

officials and some community elders and sought their advice on possible locations for different instruments. Whilst walking in the selected catchments we met with farmers and also discussed our plans with them. In these discussions we gathered information (indigenous knowledge) about local climate patterns and flow regimes. We also visited the university nearest to each site and again discussed plans and sought advice from academics with first-hand knowledge of the areas.

In each catchment the monitoring network comprises gauging structures and instrumentation, a lot of which is automated, for measuring and monitoring stream flows, soil moisture profiles, groundwater levels, rainfall and a full range of meteorological variables (i.e., relative humidity, average air temperature, wind speed and direction, solar and net radiation , soil temperature and air pressure). Meetings were again held with relevant officials and community representatives in the days immediately prior to installation. This enabled us to dispel false rumours, for example, that we were working for a flower company, with the ultimate intention of seizing land. Where instruments were installed on farmers land the purpose of the specific equipment was explained to him/her.

For some people the hydrological monitoring is already providing tangible benefits. During installation we employed local people to assist with manufacture of certain apparatus (e.g. housing boxes for pressure transducer loggers) and fences to protect equipment from livestock. For equipment that needs to be read manually (i.e. rain gauges and stage boards in the rivers) we have employed and trained local people as "observers" to make daily or twice-daily readings. In addition, for each site we have employed a "catchment coordinator" to oversee the network, make some of the more complex measurements (e.g. soil moisture profiles and groundwater levels) and liaise directly with the observers. In each case the person employed was formerly a student who had previously conducted MSc research in the catchment (funded through the N2 project) and so was already known to the community.

Although the monitoring networks have only been established for a few months we have anecdotal evidence that some of the hoped for benefits are being realized. The observers that we have met appear to be happy, welcome the additional income and are genuinely interested in the research. For example, although we have asked observers to measure river water levels twice a day, one observer in the Fogera catchment has taken it upon himself to go out whenever it rains to make additional measurements. One woman observer told us that although the pay was not much it would help to send her children to school. Furthermore, to date none of the equipment has been stolen or vandalized and whenever we are in the field children appear to be interested in what is being done and come and watch while data loggers are downloaded and measurements are made.

We recognize that participatory monitoring is an ongoing process. In order to build on our early success we plan to:

i) Provide feedback to communities on the data and results obtained[1];
ii) Feed relevant results and findings to the innovation platforms established in each area (refer the MSC Story on I*nnovation Platforms*) as well as to relevant national scientific fora;
iii) Encourage local universities to bring students and conduct field trips to the research catchments;
iv) Support other researchers (national and international) to utilize the data and add to the experimental work being conducted in each of the research catchments.

Lessons Learnt and the Future:

These three research catchments almost certainly represent the most sophisticated hydrological experimental monitoring networks ever established in Ethiopia. As such they should be exploited to the full. If they are to be utilized successfully it is clear that participation from local communities and a range of stakeholders is vital.

Supporting documentation and figures

1. Birhanu Z., McCartney, M. and Sharma, B. (2011). Hydro-Meteorological Monitoring Stations Installation in Jeldu, Diga and Fogera Districts of the Blue Nile Basin, Ethiopia from May 2011-August 2011. Draft Report

[1] We will seek advice on methods and approaches to do this in a manner that is understandable to them.

2. Birhanu, Z., McCartney, M., Leta, G. (2010). Field Visit Report. Hydrology Reconnaissance from August 4 to August 13 2010. CPWF Nile Project 2: Integrated rainwater management strategies – technologies, institutions and policies. Available online. http://nilebdc.wikispaces.com/Field+visit+report+on+Hydrology+Reconnaissance+of+Fogera,+Jeldu+and+Nekemt+Area+sites

Photos (top right, left, to bottom): Training school guard in Jeldu School on how to read rainfall data. Introducing the NBDC project and Hydro-MET instrumentation in Diga district. Weather station established in Fogera district.

Stream water level monitoring and discharge measurement in Fogera district. Working in Jeldu district with local people assisting equipments carrying. Local university students in Fogera district assisting auguring holes for soil moisture and ground water monitoring station. *Credit: Birhanu Zemadim (2011)*	
Feedback on story	• Here the intervention and change is clear. Change has already begun in the sites where instrumentation has been put. • A good example of what CPWF is trying to do - change KAS through the way research is done • It is a method with potential to become an IPG • Interesting story of the process • No change 'jumping out' • Good insights into community aspects • Evidence of learning by the project team • Early in the process • Misses some of the partner aspects and political aspects – need to be brought in much better, the ne
Conclusion	• Selected as a basin story after small revisions taking into account the comments above.

Title	**Story 4: Mainstreaming geo-referencing and the use of geographical information systems (GIS) as a tool for the planning of rainwater management.**
Authors	Catherine Pfeifer, An Notenbaert, Dejene Sahlu.

Domain : Changes in key stakeholder knowledge, attitude, skills and/or practice

The story

At the beginning of the NBDC program spatial data for the Blue Nile Basin was rather disorganized, with very few of the socio-economic data geo-referenced. In addition to that only few people were able to use GIS and limited interest was shown, especially from the social scientists, in spatial analysis and the use of GIS as a tool for the planning and targeting of rainwater management. The consequent mainstreaming of the necessity and usefulness of geo-referenced data has changed how both NBDC and partners collect, use and work with data. It is expected that this process will continue and lead to higher quality socio-economic data for the region. In collaboration with one of our partners, a tailor-made GIS course was conducted. Basic GIS skills have started spreading throughout the basin already. Through our continued interaction with some of the trained trainers, we expect that the course will reach a wide audience in the Blue Nile Basin. With the support of CPWF, a topic working group on Spatial Analysis and Modelling will take place. It is expected that this will lead to the incorporation of state-of-the art approaches for targeting and scaling out. As the basic skill sets have been successfully introduced and practiced, it will be possible to incorporate some of these more complicated techniques in the follow-up training for partners. We believe that there is a growing community of practice in the region that will lead to the increased use of spatial analysis in the design, planning and assessment of rainwater management in the Blue Nile region.

NBDC team members

The close collaboration between N3 and other NBDC team members in meetings and field visits shaped the common understanding that all surveys should be geo-referenced. Today no one goes out to the fields without carrying a GPS. A research assistant has been trained to download the collected data, and create the metadata, allowing us to manage all the data in a geo-database.

Stakeholders in the Blue Nile Basin

In its project plan, N3 had foreseen to give a GIS training to its partners. This was envisaged to be a basic GIS skills training that would enable partners to apply the targeting methodology. At a very early stage, we discovered that the GIS specialist of the Amhara region agricultural research institute (ARARI) was developing a basic GIS training for the agricultural research center. Instead of teaching an already existing basic GIS training, N3 decided to work together with the ARARI GIS specialist and come up with a training that fits the particular needs of researchers in the agricultural research centers.

The initially existing ARARI training contained topics that are very relevant in an Ethiopian setting, where most of the data is still in the form of hard copies as well as some exercises making use of data relevant to agricultural research. But, the training was lacking in hands-on exercises and did not allow the participants to acquired GIS knowledge and skills in a systematic way. The very close collaboration between N3 and the ARARI GIS specialist allowed us to develop a structured outcome-based GIS training targeted to the need of the agricultural research centers and making use of lots of local data for the exercises. As such, it is the first training in the region that goes beyond theoretical concepts of geographical information system and truly allows its participants to acquire the necessary practical GIS skills to be able to apply them in a different context. About 20 people from N3 partners, namely ARARI, OARI (Oromia agricultural research institute) and the Ethiopian rainwater harvesting association participated in the training that took place in ARARI's computer room in Bahir Dar. Trainers came from ARARI, IWMI and ILRI and all explanation was given both in English and Amharic. The joint development and running/conducting of the training also exposed the ARARI trainer to a new approach for practical GIS instruction. Participants valued this training between very good to excellent. During a recent visit to ARARI, we could find participants of the training trying to apply their skills to their own work, geo-referencing farm surveys, delineating fields and trying to map their own data.

After this successful training N3 received many requests to rerun the training, a request that unfortunately cannot be met. Nonetheless, N3 has been discussing options with its partners to rerun the training without N3 support. The ARARI GIS specialist has accepted a new job as knowledge manager at the newly created Nile Authority, a new governmental instance whose task is to monitor changes in the Nile Basin. Within his new position, the former ARARI GIS specialist is now working on the creation of a pool of trainers allowing him to easily rerun the training. Already today, two new trainings are planned: one in Amhara region and one in Oromia region for OARI. Also GIZ Amhara region as well as university of Bahir Dar have shown their interest in the training and might take over some of the concepts or exercises for their work. The co-authored GIS manual that was tested during the Bahir Dar training will be of great value for the trainers.

The development of this training took much more time and resources from N3 than initially foreseen. Building a common understanding of what and how GIS should be taught was time consuming, but also allowed for a closer collaboration and a feeling of ownership from both sides N3 and ARARI. This feeling of ownership allows today to continue the trainings without any support of N3.

Whereas N3's task is to increase geographical literacy of partners and team members, the desperate need for more skill-based training among the partners was heavily underestimated. This need can explain the huge success, and it is therefore a real opportunity that tasks of the former ARARI GIS specialist in his new position includes training people on GIS within the basin.

Feedback on story	• A nice example of something that started small and grew as the opportunity presented itself. Shows the potential of well targeted capacity development • Nice story • Working with partners, evolving the product • Small activity that grows • Approach – course – could have wider applicability • Does not capture all the richness/complexities of the processes and partnership development
Conclusion	Selected as a basin story after small revisions taking into account the comments above

Title	**Story 5: Increased understanding of the "strategies at landscape scale" concept.**
Authors	An Notenbaert, Catherine Pfeifer, Lisa-Maria Rebelo

Domain: Change in research approach

The Story

At the beginning of the NBDC project, there was no clear definition nor common understanding of what exactly entails a rainwater management strategy and most researchers struggled with the concept of landscape scale. Currently however, there seems to be a growing agreement both within the NBDC team and the wider group of NBDC stakeholders.

N3 significantly contributed to the definition of rainwater management strategies as a combination of practices across the landscape that together increase the overall productivity of the system. It is thereby important to take into account the inter-linkages that occur between the different landscape components (bio-physical and social). Our current thinking is to implement landscapes in the rainwater management context as watersheds. Rainwater management practices include physical structures and rainwater harvesting techniques but also biological practices, such as crop rotation, conservation agriculture, agro-forestry and livestock feed management. When combined these practices exhibit synergies and trade-offs at different scales. This suggests the need to adopt an integrated approach in scenario development and technology selection. It promotes a systems approach towards optimizing production activities and resource allocation in such a way that maximizes the landscape's overall economic returns and environmental benefits in a sustainable way.
We also make a difference between practice, anything done by an actor, whether it is a farmer or a community to increase water retention or water productivity within the watershed and an intervention, anything done by a government or NGO's or any other actor to initiate a practice change. Though this separation is not always straight forward, it is a way to initiate discussion between social and bio-physical scientists.

These definitions contributed to a fundamental change of how N3 understands and models rainwater management. The in-depth adoption studies will look at economic, institutional, and ecological factors, in addition to technical factors, as they all matter for RWM technology adoption and implementation.
In addition to defining extrapolation domains for single practices (including bio-physical suitability and socio-economic adoption criteria), we also plan to come up with extrapolation domains for rainwater management strategies at a landscape scale. In addition we try to link strategies to a set of interventions, allowing to somehow taking institutions into account.

Creating these new definitions involved many steps and many researchers and partners. The initial understanding of the landscape emerged during a field visits involving scientists from N2 and and a variety of wider NBDC meetings. The understanding of the need to look at combinations of strategies also emerged through various stakeholder meetings held with N3 partners.

One of the major constraints connected to this definition is the complexity involved. It is very difficult to get people talk about a multi-objective problem with multi-criteria to come up with an optimal choice. Both, NBDC researchers as well as N3 partners easily get confused and it is not straight forward to go beyond the concept of RMS and come up with operational strategies. For this reason, N3 has developed the "happy strategy" game, where people are asked to choose a practice and then find other people to form a strategy around a landscape with given socio-economic and bio-physical characteristics. This game was played for the first time at the NBDC Stakeholder meeting in Bahir Dar, allowing all the NBDC researcher and stakeholder to initiate a discussion on complex combination of practices and learn from each other. Though the game still needs to undergo major revision, it has the potential to be adjusted for communities and innovation platforms in order to start a dialogue between at grassroots level. N2 researchers have already mentioned their interest in digging into these options further.

Feedback on story	• Perhaps the most important change in NBDC • Potentially MSC at BDC level with practical tool (the game) • Bigger than N3 • Could perhaps be linked to another N5 story 'From Livestock-Water towards Consolidated RWM solutions in the Nile Basin'? • Possibly a candidate for most significant research story at BDC level because it involves the BDC as a whole getting its concepts sorted out, and the development of a very practical tool to help bring this understanding to all levels
Conclusion	• Selected as a basin story after small revisions taking into account the comments above

Title	**Story 6: Change in project strategy resulting in additional outcomes / benefits.**
Authors	**Teklu Erkossa and Charlotte MacAlister.**

Domain (i.e., Outcome, research, lessons): Domain 2 /3 - *Change in the research approach / Lessons learnt?*

The Story:

The Nile BDC program is composed of five interlinked projects such that some project outputs are inputs to the others. One of the projects in the program is N4, which was crafted to quantify the consequences of improved rainwater management systems on community livelihoods, resource productivity, land quality and downstream water quality and siltation, largely based on data to be obtained from N2, which in itself was supposed to extract the data from secondary sources. However, quantitative data on crop and livestock management practices and their direct and indirect effect on water productivity and the environment at large were not readily available for the selected landscapes and their different agro-ecologies and farming systems. Consequently, it has become evident that N2 could not provide these data. This forced N4 to think innovatively to generate the required data while contributing to capacity building.

Accordingly, N4 and N2 have developed a concept note for MSc students that would be recruited to assist in collecting data including crop and livestock feed, management practices and estimating sediment loss, while mapping the land use and land cover types of the selected landscapes. Eight MSc students (3 on crop management practices, 3 on Sediment quantification and characterization and 2 on livestock management and feed sourcing) from different Universities in the country have been selected on competition basis and their research projects will be sponsored by the program. Supervised by N4 and N2 staff, the students are collecting data, which will be used both for their MSc. thesis and support N4 and N2 project objectives. Currently crop and livestock data collection as well as quantification and characterization of sediment loss from the three catchments, including nutrient content, are in progress. Explanatory factors for the sediment quantity and quality, which include catchment characteristics and crop management practices, will be identified. The cost of the soil loss from the catchment at the field and landscape levels in terms of productivity loss or replacement costs and the downstream impacts through water quality degradation and siltation of water infrastructure will be analyzed at a larger scale. Together with the livestock related data, this will enable us establish the current and RWM scenarios impacts on livelihood and environment in the landscape, which would later be scaled up to the basin level. This change may not only contribute to the quality of stipulated scientific outcomes but also will result in additional capacity building output that was not previously planned in the project. However, this change is not without challenges since it increases pressure on the budget of the project.
life.

Feedback on story	• This story should be enriched; the story needs more detail. An important project-level change for the next six monthly reporting.
Conclusion	• The story points to potentially significant changes, but has too little detail. Needs to be substantially revised and included as a 'project story' in the project report.

Title	**Story 7: Integrated approach to the analysis of RWM impacts in the Blue Nile using ECOSAUT.**
Authors	Kindie Getnet, Nancy Johnson, and Charlotte MacAlister.

Domain (i.e., Outcome, research, lessons): Domain 1 - *Changes in knowledge attitude & skills or practice*

The Story:

This project is about showing whether rain water management systems (RWMs) are feasible and effective. It seeks to quantify the consequences of improved RWMs for community livelihoods, resource productivity, land quality, and downstream water quality and siltation. The project develops methods to anticipate *ex-ante* the likely consequences of introducing improved RWMs as well as monitoring and measuring these consequences *ex-post*. The project conducts research activities at three sites (Diga, Fogera and Jeldu) as representative sites for heterogeneous biophysical and socioeconomic situations in the Blue Nile Sub-basin.

In terms of analyzing the best RWMs for different parts of the basin, in the context of livelihoods and economic benefits, the project found it important to use an integrated approach (multidisciplinary analysis), instead of cost-benefit analysis, and primary data, instead of secondary data.A switch from the initial idea of using cost-benefit analysis to multidisciplinary approach for RWMs impact analysis is made for it was found more appropriate to address both socio-economic and bio-physical issues (social, economic and environmental). The approach reflects the importance ofconsidering and addressing multiple objectives pursued in a watershed. By addressing issues related to multiple objectives,it becomes possible to identify and recommend RWMs evaluated against social, economic and biophysical criteria. RWMs filtered through such multiple criteria will have a better chance of adoption and sustainable utilization among communities.

Integrated approaches to RWMs analysis are generally data intensive and need data on integrated socioeconomic and biophysical processes. Such approaches often need data that capturealso the existing causal relationships between socioeconomic and biophysical processes. More often, it is difficult to find such data from secondary sources, typically so if the secondary source data are gathered at a different scale from that of a specific catchment and when they do not show the causal relationships between socioeconomic and biophysical processes. Consequently, the socioeconomic impact analysis research activity of N4 switched from exclusive dependence on secondary data towards using primary data. The multi-criteria modeling approach adopted for the study (Economic, Social and Environmental Modeling) needs survey data that capture the relationships existing between socio-economic and bio-physical dynamics. As a result, the socioeconomic research team of N4 has been engaged in collecting primary data from the three research sites through August 2011.

Feedback on story	• This story should be enriched; the story needs more detail. An important project-level change for the next six monthly reporting.
Conclusion	• The story points to potentially significant changes, but has too little detail. Needs to be substantially revised and included as a 'project story' in the project report.

Title	**Story 8: Applying global weather forecasts to generate climate data, drive hydrological models and plan water use applications.**
Authors	Dan Fuka and Charlotte MacAlister

Domain (i.e., Outcome, research, lessons): Domain 2 - *Change in the research approach*

Story:

Both MET and hydro data are required basinwide in order to drive hydrological and water resource models. Even when such data are available they are often scarce and unreliable: inconsistent recording period / breaks in data; and quality not guaranteed. Accessing climate data from national agencies can be time consuming and when the data is eventually delivered its use is often limited and it cannot be feely shared.

The introduction of global climate data sets provides one solution to this problem. N4 is utilizing global climate reanalysis data (CFRS) to generate a long term and up to date weather data set, which can be applied to drive hydrological models – the 'forcing' variables. This has approach has many advantages: data is available for >30years and is continuously updated to present time; it is high resolution (up to 1 hour); it can be used to forecast weather up to 15 days in advance. This presents many possible applications not only in research but in planning and management. The data can be used in the areas of water availability/water resource planning, PES; climate change; crop productivity; to provide data for forecasting and management such as irrigation scheduling.

Data have been prepared for the whole of Ethiopia and could be expanded to all of Africa.

Feedback on story	• Potentially a very important research innovation with far reaching uses and consequences. Definitely worth revisiting. • As of now, too little to go on. Need to know who is doing the work, what is the role of N4, and how unique is it? • Has IPG potential.
Conclusion	• The story points to potentially significant changes, but has too little detail. Needs to be substantially revised and included as a 'project story' in the project report.

Title	**Story 9: Communicating Inside Out – The Nile Basin's First Year**
Authors	Peter Ballantyne

Domain (i.e., Outcome, research, lessons): Domain Outcome

Story:

As in the other basins, the Nile Challenge comprises several linked projects – each with different leads, participants and partners, and outcome logics. The N5 'coordination' project aims to help project team members act as "one single project team, delivering promised and emerging outputs as required and using technical, institutional and advocacy strategies to bring about change in the way research, development and policy actors work in the basin."

Getting good communication among the various actors and partners is essential for the whole program to operate, and to have impact.

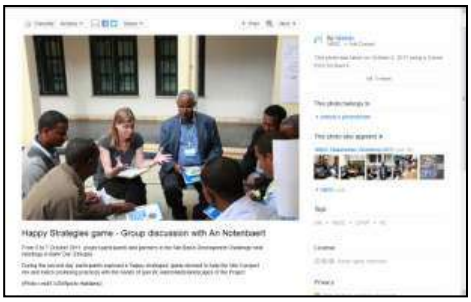
To serve these needs, we started our communication activities 'inside' the Challenge. In the past year, **we have started to change the ways that our research knowledge is captured, shared and communicated. We are also changing the knowledge sharing behavior of project staff** – by encouraging and supporting them to adopt a wider, richer – and ultimately more effective and impactful - set of tools and approaches to project interaction, documentation, reflection, and learning.

The first priority – and our most significant progress - has therefore been 'inside' the Challenge. We are also starting to put in place systems and relationships, and we are using knowledge products, face to face meetings and extended communication approaches to communicate ongoing activities that reach wider audiences, nationally and beyond. The idea is to create the audience and demand for what we will produce. An important spillover to the 'outside' is in the area of communication where several changes in approach (or decisions) are directly linked to our activities.

Five promising changes

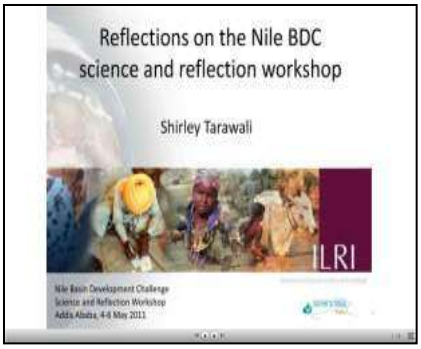
1. *Project and event planning and reporting* – Within the Basin, we use an **open wiki** accessible to all project staff (and visible to others – http://nilebdc.wikispaces.com), to share plans and information needed to coordinate the Challenge. All events are planned and reported on the wiki. This includes the two major reflection meetings of 2011, the Basin contributions to the IFWF3, and the monthly progress meetings. Almost all project staff members received basic wiki support and training. The wiki now has 55 members with edit rights; people shared 189 files, and between July 2010 and September 2011 it had 34000 views. To facilitate interaction among project actors spread across different locations and institutions, we set up a **yammer** network in 2010. So far the 56 members shared some 700 updates with colleagues. The significant changes are the adoption of new tools by most staff and the gradual willingness to share on these platforms (instead of in private email conversations). For the project, we have a richer knowledge base to draw on; and all staff can contribute/become aware of project activities.

2. *Documenting discussions and events* – We recognize that the processes followed and the discussions and decisions along the project history are also important (even when findings are not yet ready). Thus, we use the wiki and website, as well as video and photos to record and capture significant activities in the project. This includes archiving reports, documents, presentations, posters etc in an open repository (http://cgspace.cgiar.org/handle/10568/2296). The start of participatory video in N2 offers exciting opportunities to create and capture knowledge. The significant changes are that we capture and make public a far greater proportion of what a typical project produces, we document processes openly and quickly, and we seek to tell the process story as well as sharing the findings.



3. *Using different meeting formats* – Workshops, events, and meetings are important parts of the Challenge, and we need to make sure they are a good use of time. We have thus paid much attention to the design and facilitation of our larger events – to maximize participation, encourage cross-project engagement, and generally engage the participants so we and they benefit from the discussions. It is now 'normal' for all events to be designed with multiple contributions and using participatory processes and sessions. For the May 2011 workshop, we introduced 'hard seat' interviews instead of formal presentations (http://nilebdc.org/tag/hard-seat); in the October meeting, we devised a 'game' format to mobilize experiences of the participants. We use video and photos to capture reports and give a flavor of the meetings and we aim to report almost 'live' from events using our wiki, website and other social media. The significant changes are the commitment of event managers to try different formats, to avoid one-way communication, and to report and share online.

4. *Publishing open products* – Since the start of the project, we have published as many finished and intermediate products of the projects as possible on the Internet, in full, using an open license, and in open platforms. These include Dspace for reports, flickr for photos, slideshare for presentations and posters, and blip for video (see http://nilebdc.org/comms-tools). The significant change is that such a large proportion of the projects' products are already open and accessible.



5. *Spillovers to other organizations* – One of the most interesting changes has been the take up of these approaches by others. Our Dspace repository has evolved to include a repository for the CPWF; the Google Calendar is being used by CPWF and the Mekong; The CPWF has a lively Yammer network; our presentations are posters are combined in a shared CPWF slide share account. We also use the NBDC 'model' as a demonstration/discussion base for other ILRI projects and have shared it with NARS partners from Kenya and Ethiopia.

Whose behavior is being changed?

So far the changes are most visible in some **project staff**. All have been exposed, and we see gradual acceptance of the different approaches. There is still a long way to go for us to achieve 100% adoption – if such is possible! The most important change is perhaps the recognition that 'different communication is possible' - and can have benefits.

As mentioned above, we see changes in other parts of the CPWF and the CGIAR. Other parts of **ILRI** are also adopting elements of the 'Nile' approach – usually unconsciously. ILRI communication staff members most concerned with the projects are adopting new, efficient, client-oriented ways of working that benefit them and ILRI. A different model of research communication is emerging.

Where do we see the least change so far?

At the level of communities and farmers where we count on other partners and the emerging innovation platforms, for instance, to be the main communication carriers and spaces for interaction, learning and on the ground impact.

How significant the changes?

So far, this is difficult to judge and assess. Several individuals have become keen adopters of different aspects of the model. We have been able to generate much more 'raw material' on the various project activities that we can use to build communication products and stories around. Photos, power points, and reports have all become accessible to project staff without barriers; smaller activities that would normally remain invisible or beneath the radar are reported and shared. Project coordination and event preparation has become more transparent and participatory, with minimum email traffic and outputs shared in accessible ways.

The main challenge is to make 'open sharing' the default mental setting for all project staff – many people are not used to documenting and sharing what they do/learn on a regular basis without strict instructions.

Feedback on story	• Not yet received
Conclusion	

Title	**Story 10: National Platform building on land, water and natural resource management: Momentum for Change**
Authors	Kees Swaans, Tilahun Amede

Domain (i.e., Outcome, research, lessons): Domain 1 + 2 (knowledge, attitudes, practices; research approach)

The story

Various national and regional institutions in Ethiopia are engaged in natural resource management, particularly in land and water, but for the last 30 years there has been very limited opportunity for them to share experiences, identify gaps and feed key insights to policy makers. The limited fora created have failed as they were top-down and meant for conveying government policies. After a thorough analysis of the historical perspectives, actor-landscaping, analysis of the success and failures, and wider consultation the Nile BDC team organized a workshop on the 8th of April, 2011 to initiate a national platform along with key national players to facilitate innovation and link research with action. We brought on board more than 80 people from at least 55 organizations/institutes, representing politics, government, research, NGO/CBOs, private sectors, donors, etc. The establishment of a national platform was widely supported, not the least by the Ministry of Agriculture, whose representative the State Minister for Agriculture indicted that we have been waiting for such an initiative for more than 10 years. There was an overwhelming agreement that a well negotiated national platform can be a mechanism to minimize duplication of efforts and enhance communication between actors and across sectors for improved land and water management in the Nile Basin or even beyond.

The Change

a) There was increasing recognition by the major development actors for integrating water into the agendas of land management and watershed management

b) A steering committee which will facilitate the platforms sustainably was assigned and task shared;

c) Regional research centres (e.g. Amhara Regional Research Institute, ARARI) have initiated their own platforms bringing universities, **research institutions, bureau heads and local policy makers together. The establishment meeting was conducted on Oct 8th in Bahir Dar.**

The national platform will link local experiences (including the evidence coming from local platforms established by Nile BDC) with national planning, and open opportunities to engage with policy makers. The initiative has also led to the emergence of other regional platforms. For instance our partner institution Amhara Regional Agricultural Research Institute (ARARI) for called a regional event on Oct 8th, 2011 and brought together about 95 people to establish a regional platform on 'Agricultural research and innovation' including seven national universities. This event was organized following the NBDC stakeholder workshop, which was chaired by the Nile basin leader.

Critical factors that led to the change

The enthusiasm and support for a national platform is shared by a wide diversity of players and sectors. This is not as obvious as one may think. Ethiopia has had a turbulent history and its governance structure over the past few decades is characterized by continuous restructuring and commonly top-down planning with limited participation of NGOs/CBOs or the private sector. In recent years, however, there has been a substantial change in governance structures. The extension system has been reformed and participatory approaches and decentralization is embraced; sectoral integration and evidence based planning are still in its infancy though and needs to evolve.

Future implications for action and research

While the support for a national platform provides a 'window of opportunity', Nile BDC needs to ensure that it has an actual impact on the innovation capacity in the system and avoiding it becoming the latest 'talk-shop'. The

platform intends to create a national movement on land and water management stimulate sharing and learning among actors based on lessons from practice, to enhance effective coordination within and across sectors, and to address institutional and policy constraints. Key strategies will be based on 'local evidence what works', 'engagement', and influence of so called power houses. The whole process will be closely monitored in terms of processes and changes in terms of interactions, practices/habits, and the enabling environment for innovation in land and water management in the Nile Basin. We are already witnessing the outcome that DFID has requested N5 to submit a proposal on strengthening national platforms for facilitating innovations and learning in Ethiopia. However, one of the main challenges of the initiative is how to ensure that it is self sustained and is going beyond the project life of Nile BDC.	
Feedback on story:	• Not yet received
Conclusion:	

Title	**Story 11: From Livestock-Water towards Consolidated RWM solutions in the Nile Basin**
Authors	Tilahun Amede and Don Peden

Domain (i.e., Outcome, research, lessons): Domain 1 + 2 (knowledge, attitudes, practices; research approach)

Story:

The agricultural sector is one of the largest user of water resources and its pressure could be exacerbated due to increasing water demand and climate change. Although the crop-water relationship was well established, livestock-water interaction and agricultural water management beyond irrigation was often ignored. This story displays the evolution of water-centred research by ILRI and IWMI starting from understanding livestock-water linkages during CPWF Phase I (2004-2008) through analyzing crop-livestock production system with a BMZ supported project on water productivity in crop-livestock systems (2007-2009) to a broader water-cantered landscape management and the institutional linkages required to employ these strategies at landscape scales through the Nile Basin Development Challenge operating since 2010.

The Changes

From the outset it doesn't look very complicated to understand the relationship between water and livestock; like any other living thing animals drink water, eat feed to survive and to produce livestock products and services. The ultimate shock appeared when researchers from around the world, including researchers from FAO bombarded livestock as the major water depleting living things through their influential book 'The Long Shadow'. The debate on how much water livestock uses to produce a liter of milk or a kg of meat was a global issue and making headlines. The debate further attracted the attention of environmental groups and politicians worldwide. This was also the time the CPWF-supported ILRI project on Livestock-water productivity was born.

1. Understanding the negative and positive effects of livestock in agricultural land and water management and water productivity of livestock under various management practices attracted the attention of researchers and the ILRI management at large, particularly because of the unexpected debates emerging in various regional and international fora. While the CPWF –supported project further steered the discussion and developed the livestock-water framework and identified three major pillars for improving LWP (Peden et al, 2007), a follow-up BMZ-supported project quantified the potential contributions of these components to water productivity and identified the key drivers (policies, institutions and markets) affecting the adoption and integration of these interventions.
2. Research findings revealed that WP is beyond the livestock, it is about the market incentives, institutional mechanisms, up-stream-downstream relationships, collective action and policy framework.
3. The Nile BDC programme, which has embarked on rainwater management systems has capitalized on these lessons and improved the understanding further through linking innovations with practices. NBDC learned that increasing production is not always sustainable. A growing demand for crop and livestock products continues to drive extensification - extension of agriculture into low potential areas throughout the Blue Nile basin, and in very few cases is driving intensification. Both extensification and intensification are increasing pressure on water and other natural resources and threatening to undermine long-term productivity. Approaches to improving livelihoods and resilience need to take into account complex linkages between different components of agricultural and livelihood systems. Connectivity to markets or finance and the institutional coherence with which water and land resources are shared have an impact on performance.

The long years research process in water productivity enabled the emergence of integrated rainwater management strategy that includes both the processes and interventions was necessary, which would encompass the following:

- Strategies that would improve water management at landscapes and the basin
- The processes of engagement and co-learning with broader partners working on land, water and vegetation management through networking and formation of innovation platforms at landscape and national levels;
- Continual monitoring, adjustment and learning on landscape management, and influencing change in management of water, livelihoods, ecosystems and integration of these at various scales

The RWMs called for a wider level of water-centred engagement with national and regional players working in rainfed crop-livestock and pastoral systems, whereby emphasis is given to sustainable landscape productivity through addressing the challenges of water depletion, land degradation, low productivity and institutional capacity. In other words, the research question has moved from water productivity to crop-livestock system productivity.

The emergence of the Rainwater management concept, which comprises the capturing, storing, managing and efficiently utilizing water at landscape scales, became appealing for the wider actors, particularly those who used to promote watershed management as key NRM strategy but ended up working on soil conservation structures, without due emphasis to the water budget of the system. RWM strategies also helped national institutions to move from rainwater harvesting focus towards integrated rainwater management, from surface water management towards integrated blue and green water in the landscape; in the soils, reservoirs, springs and small dams for productive and ecological services. This broadening concept, with institutional, technological and political dimensions, is calling for wider participation of actors at farm, landscape, national and regional scales. It has inserted new thinking in ongoing national programmes, including the multi-donor forum 'Sustainable Land Management, SLM', which is now integrating water in the land management agenda.

Whose behaviour is being changed?

Internal: The NBDC team members have been changing in terms of methodology development, and working approaches, particularly in terms of moving from disciplinary-based research towards integrated landscape management.

External: Partner national and regional research institutes have started to develop projects and programmes in rainwater management and started to invite NBDC for closer interactions. The rainwater management concept is bringing together non-traditional partners and also strengthens the linkages between CGIAR centres operating in the region. For instance, ILRI and IWMI started with one joint appointee have now more than 8 national and international joint appointees working on these same initiatives. The upcoming multi-million upcoming ILRI-led project (LIVES project), is going to further strengthen the water-centered research in Crop-livestock systems in the region in the years to come.

Critical factors contributed to the success of the story

- The most important factor contributed to the success was recognizing the knowledge gaps in water research by major research players, and the presence of supportive leadership that allowed scientists to understand the dynamics and develop frameworks for broader understanding.
- Publishing journal papers on Livestock-water-Land issues was very difficult until the time our team has produced a special issue in The Range Land Journal, which introduced the issues to wider users;
- The interest of CPWF in pursuing the water-centred rainwater management at landscape scales created space for further investigation and learning.

Future implications

Using water as entry point, RWMs is becoming an appealing strategy for landscape management for addressing food security, climate change adaptation and improving environmental services. However, there is a need for further fine tuning the strategies and generating evidence on the contributions and tradeoffs of various landscape components in terms of water use and resource flows.

Feedback on Story	• Not yet received
Conclusion	•